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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,935

07/24/2008

Boris L. Kuzin

05788.0402

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22852 7590 01/06/2012
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EXAMINER

MOHADDES, LADAN

ART UNIT

PAPER NUMBER

1726

MAIL DATE

DELIVERY MODE

01/06/2012

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,935	Applicant(s) KUZIN ET AL.	
	Examiner LADAN MOHADDES	Art Unit 1726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1-78 is/are pending in the application.
- 5a) Of the above claim(s) 1-39, 50, 52-54 and 56-77 is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 40-49, 51, 55 and 78 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 40-49, 51, 55 and 78 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Joerger et al. (European Solid Oxide Fuel cell Forum, 2002, hereafter referred to as JOERGER, already of record).

With respect to claims 40, 45 and 78, JOERGER discloses a solid oxide fuel cell (SOFC) with an anode, a cathode and an electrolyte membrane disposed in between the cathode and the anode (Introduction and Experimental), wherein the anode comprises a cermet comprising a metal (Experimental) uniformly interdispersed (Fig. 1) wherein the metal content is more than 50% (Experimental and Results). JOERGER does not expressly disclose the specific surface area of the cermet, however, a cermet with the same composition, microstructure and particle size will inherently have the same surface area.

Alternatively, it would have been obvious for the person of ordinary skills in the art to adjust the surface area to obtain optimum conductivity (Results and Discussion).

With respect to claims 41-43, JOERGER discloses copper (Introduction and Experimental and Results).

With respect to claim 44, JOERGER discloses copper with 60 and 73 wt%.

With respect to claim 46, JOERGER does not expressly disclose the porosity of the cermet but teaches that the porosity can be measured and adjusted bases on the

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percentage of the copper and reduction process to obtain optimum conductivity (Results and Discussion). Therefore, it would have been obvious for the person of ordinary skills in the art to adjust the porosity to the levels disclosed by the Applicant to obtain optimum conductivity.

\with respect to claim 47, JOERGER discloses specific conductivity higher than 0.01 S/cm at 700 °C.

With respect to claims 48 and 49, JOERGER discloses gadolinia doped ceria (Abstract and Experimental).

With respect to claim 51, JOERGER discloses platinum cathode (Experimental).

With respect to claim 55, JOERGER discloses yttria-stablized zirconia (Experimental).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
9. Claim 40-45, 51, 55 and 78 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lockhart et al. (US 5261944, hereafter referred to as LOCKHART) in view of Seabaugh et al. (US 7595127, hereafter referred to as SEABAUGH).

With respect to claims 40-43, 45 and 78, LOCKHART discloses a solid oxide fuel cell (SOFC) with an anode, a cathode and an electrolyte membrane disposed in between the cathode and the anode, wherein the anode comprises a cermet comprising a metal uniformly interdispersed, wherein the metal content is more than 50% and wherein the specific surface area is $1.9 \text{ m}^2/\text{g}$ (Claim 12 and Example 12 and table II). LOCKHART fails to disclose that the metal has a melting point equal or lower than 1200 C (or higher than 500 C as in claim). In the same field of endeavor, SEABAUGH teaches that metals such as copper and nickel can interchangeably be used as metallic portions of a cermet (col 1: ln 67 to col 2:ln 2). As stated in *KSR International v. Teleflex Inc.* (550 USPQ2d 1385), by following the factual inquiries set forth in *Graham v. John*

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Deere Co. (383 U.S. 1, 148 USPQ 459 (1966)), the following rationales establish a prima facie case of obviousness. The rationales are:

- (a) Combining prior art elements according to known methods to yield predictable results;
- (b) Simple substitution of one known element for another to obtain predictable results;
- (c) Use of a known technique to improve similar devices, methods, or products in the same way;
- (d) Applying a known technique to a known device, method, or product ready for improvement to yield predictable results;
- (e) "Obvious to try" - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- (f) Known work in one field of endeavor may prompt variations of it for us in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- (g) Some teaching, suggestion, or motivation to combine prior art references that would have led one of ordinary skill to modify the prior reference teachings to arrive at the claimed invention.

Therefore, it would have been obvious for the person of ordinary skills in the art at the time the invention was made to substitute nickel metal of LOCKHART with copper as doing so is within the practitioners choice of design as taught by prior art.

With respect to claim 44, LOCKHART discloses a metal content of 35-70 wt%. As stated in *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990), "in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists". (See also *In re Geisler*, 116 F.3d 1465, 1469-71, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997).

With respect to claim 51, LOCKHART discloses lanthanum manganate cathode (Claim 12).

With respect to claim 55, LOCKHART discloses yttria-stablized zirconia (Claim12).

Response to Arguments

10. Applicant's arguments with respect to claims 40, 43, 45, 55 and 78 have been considered but are moot in view of the new ground(s) of rejection.

11. The remainder of Applicant's arguments filed 10/11/2011 has been fully considered but they are not persuasive.

With respect to Applicant's arguments on pages 11-12 of Remarks concerning prior art JOERGER, the examiner notes that as noted by the Applicant in the Remarks, paragraph [0016] of published present Application discloses:

"In the present description and claims as "substantially uniformly interdispersed" is meant that the portions of the cermet are intimately admixed in the entire volume of the cermet." [emphasis added].

Although, in the disclosure of JOERGER the anode composition containing higher content of metal resulted in heterogeneous microstructure with large agglomerates of copper, but the portions of the cermet are nevertheless intimately admixed in the cermet as shown in Figure 1 (72 wt% CuO).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LADAN MOHADDES whose telephone number is (571)270-7742. The examiner can normally be reached on Monday to Thursday from 8:30 AM to 6:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LADAN MOHADDES/
Examiner, Art Unit 1726

/Patrick Joseph Ryan/
Supervisory Patent Examiner, Art Unit 1726